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DIPHTHERIA AND DIPHTHEROID.

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DIPHTHERIA AND DIPHTHEROID.

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SINCE the days of Brettonneau, who in the year 1826, gave the name diphtherite to the disease now under consideration, a number of names have been proposed.

In 1859 diphtherie was substituted for diphtherite by Brettonneau, he having discovered that the disease is not of an inflammatory character.

Diphtheria was a word unknown to English medical literature until 1859, when the "Sydenham Society" published a volume of memoirs on this disease translated from the French of Brettonneau and others.

The disease was described, however, by Hippocrates, Celsus and others, from the dawn of medical history, without a just appreciation of its distinctive nature; therefore, I hope I may be pardoned, or, not too severely criticised if, in a modest way, I offer to the profession, not a synonym, but a "running mate," a companion word to the name diphtheria, in the word diphtheroid, as expressive of a condition strongly allied to diphtheria in an anatomical and clinical sense; if not in an etiological nature.

The present state of knowledge, as published by bacteriologists, while somewhat confusing, can be honestly construed into a probable final separation of the different bacteria which dominate the different forms (as some experimenters have expressed themselves) of diphtheria. Thus, Loeffler and Klebs, claim to have found the germ

of diphtheria similar to that discovered by Roux and Yersin, of the Pasteur laboratory, which is of the bacillus variety. While more recent investigations by Dr. Mitchell Prudden, seem to establish the claim that the streptococcus is the germ of diphtheria.

Prudden was enabled by cultures from twenty-four out of twenty-six cases to reproduce the germ identical to that found in the pseudo-membrane, though unable to reproduce the typical lesion in animals inoculated either with the membrane or cultures therefrom; yet he did reproduce the streptococcus in large numbers associated with phlegmon and erysipelas.

He claims that the streptococcus diphtheria is identical to the streptococcus pyogenesis and streptococcus erysipelatos, and that this identity furnishes an explanation of the frequent association of these diseases, and the resulting phlegmon and erysipelas from inoculations of diphtheric cultures.

It is now many years since my attention was drawn to the association of follicular tonsillitis and diphtheria. At the time in question, I had under my care in a family, a case of pure and simple follicular tonsillitis, and a case of what I considered genuine diphtheria; both progressed apparently to recover; but the child with tonsillitis was allowed to expose itself on an inclement day. The night following, I was called, and found a case of croup, which proved to be membranous, and resulted fatally; notwithstanding tracheotomy was early resorted to.

The case of diphtheria did well, and gave no further trouble.

Now I am constrained to believe that if not the same germ (if germ at all) existed in both of these cases, that a germ did exist in the follicular tonsillitis capable of producing a pseudo-membrane.

I would not be understood as claiming that follicular tonsillitis is diphtheria; such a statement would be palpably dishonest, for we all know that the former disease is

ordinarily of trivial importance, and frequently gets well with almost any or no treatment; but I do claim that we frequently do have cases of pure and simple follicular tonsillitis, which are associated with, or followed by a deposit on the posterior pharyngeal walls, soft palate and uvula, similar in its persistence and anatomical appearances to that of diphtheria; and yet not characterized by that amount of constitutional disturbance we meet with in diphtheria of a few days' standing. Neither do we have that depression and paralysis following this condition so common after diphtheria.

Now, it is this very condition, so closely allied to diphtheria, and yet, not possessing many of the symptoms of diphtheria mentioned above, to which I have applied the name of diphtheroid. To illustrate, I will relate a few recent cases which occurred during the prevalence of diphtheria in our city during the past winter:

CASE NO. I.—Mrs. N——, was taken January 28th, with follicular tonsillitis; considerable fever, rapid pulse, and swollen tonsils, which were studded with ulcerations.

There was not the slightest deposit on the tonsil for three or four days, when there appeared a membranous exudation, or, deposit on the palate, which persisted, reappearing when destroyed, for about one week.

CASE NO. II.—Miss P——, was taken sick February 3rd, with well-marked case of follicular tonsillitis; fever, rapid pulse, etc. On the fourth day there appeared on the posterior pharyngeal wall, a genuine membranous deposit, which finally extended to palate and uvula, not in a continuous membrane, but in patches. With the subsidence of the follicular tonsillitis, there was marked improvement of the constitutional condition, though the deposit persisted until February 14th, a period of ten days.

I could refer to other cases, but these two will illustrate a condition which I could not call diphtheria, nor could I say that they had continued as they had begun, as follicular tonsillitis. Therefore, I told my patients and their friends,

that they had diphtheroid ; a condition like and yet not diphtheria. At that very time I had on hand cases of the genuine type of diphtheria, several proving fatal; so that I was in a condition to differentiate between genuine diphtheria and a condition of the throat, which I could not conscientiously call diphtheria.

Is it not highly probable that in the light of modern investigation, in the line of bacteriology, we may finally be furnished with a differential diagnosis in these throat diseases which will correspond with what we as practitioners observe so often clinically?

Prudden says (after a most thorough and scientific investigation of his twenty-six cases, in which he found the streptococcus in all but two as the constant and predominating germ) that it must not be taken that diphtheria cannot be produced by any other microbe than the streptococcus; though claiming his germ (the streptococcus) to be the *only* germ which is to be found constantly in the pseudo-membrane. Therefore is it not fair to presume, that when we have such an unsettled, and as yet, imperfect knowledge as to the identity of the germ of diphtheria, and when we take into consideration that Miller, of Boston, has isolated and cultivated not less than thirty different varieties of bacteria which infect the mouths of well people, and Prudden twenty varieties from the pseudo-membrane, that we have as standing in a causal relation in the production of some of the pseudo-membranous patches, a germ differing in its tendency to the production of a condition, both local and constitutional, not tending to fatality; a condition, which we may call, if you please diphtheroid.

In 1887, Loeffler made a communication, in which he reported one of his cases as representing and containing a bacillus very similar in its morphologoical and biological characters to those found in his earlier studies, but which was without effect upon animals. This he calls the " pseudo-diphtheritic bacillus."

In 1888, Von Hoffman described the very frequent occurrence in twenty-six out of forty cases on the mucous membrane of the larynx, as well as in diphtheria, scarlatina, measles, and simple catarrh, as in quite normal conditions, a bacillus apparently identical with the "pseudo-diphtheric" bacillus of Loeffler. That is, it was very similar in morphology and growth to the diphtheria bacillus of Loeffler, but not virulent in character.

A careful comparison of the genuine with the pseudo-diphtheritic bacillus, led Von Hoffman to the recognition of morphological and biological distinctions, by which the two forms could be recognized.

Prudden says "that there is a form of croupous inflammation of the pharynx, larnyx and other air passages, not due to active chemical irritants and not occurring as we say 'spontaneously,' which is not obviously infectious, and not apparently communicable from one person to another, would seem to be well established by clinical observation."

On the other hand he says, "there is every reason to believe that many cases presenting the clinical features of simple croupous inflammation, may be really diphtheria, as judged from the stand-point of etiology; but, in which from some ineffectual condition of the germs, from the smallness of the numbers inoculated, or from the resisting capacity of the individual, the action of the poison is limited to the seat of inoculation."

The intimation that he gives, that other organisms produce a set of symptoms and lesions, to which we give the name of diphtheria he says, "the more readily accounts for the great variability in both symptoms and lesions in well marked groups of cases," would seem to indicate that he recognizes distinct forms of the disease or a disease strongly resembling diphtheria, and produced by a different bacteria.

Therefore, we are led to the conclusion that diphtheria either has not a constant cause, is not the product of a

specific germ, or that we have been giving the name of diphtheria to a condition, pseudo-membranous in character, and yet lacking *many, very many*, of the etiological characteristics of genuine diphtheria; and which is so amenable to treatment that we are too often led into a feeling of false security and confidence, which, sooner or later recoils upon us, to our great sorrow and chagrin.

In view of these facts, I have been emboldened to offer to the medical world, as expressive of a more exact condition, the name diphtheroid, as not so misleading and so alarming to the public, as the word diphtheritic.

If we are justified in the two differential names, "chancre" and "chancroid," there seems good ground for the establishment and coinage of the word diphtheroid, to be added to our nomenclature and bearing an analogous relation to diphtheria, as does "chancroid" to "chancre;" or further, as "varioloid" is mitigated "variola."

So diphtheroid may be diphtheria, mitigated by some cause as yet unknown; or, by a germ peculiar to itself, in form and growth, and distinct in species, from the bacillus diphtheria, yet to be recognized and isolated by future bacteriological investigations.

Is it not our duty to ourselves, as honest physicians, and to a trusting public, to remove as much as possible the mystery surrounding disease, and the alarm which attaches to a name carrying so much dread as that of diphtheria?

To him who cures diphtheria with iron, potassium, chlorate, sodium-hyposulphite, chlorine, and an endless list of *never failing remedies*, I would respectfully say, be on the alert, "lest at such a time as ye think not" the enemy comes, with such vigor and strength as ye dreamed not of, and sadly disabuses your mind, and destroys your armor as the chaff is blown by a strong wind.

In reviewing the current literature on the subject, coupled with a pretty liberal clinical experience, I am ready to accept "*in toto*," the germ theory of the disease,

and in treating it, to resort to those measures of prophylaxis and treatment tending to the destruction of the micro-organisms. Before my local county society, I have claimed that the disease is primarily of local origin. This conclusion is largely based upon clinical experience.

At a recent meeting of the New York County Medical Society, Dr. J. Lewis Smith read a paper on diphtheria, in which he quotes Oertel's most recent utterances, in which he "expresses the opinion, that while bacterial organisms give rise to diphtheria, they do so, not by their direct action, but by producing a ptomaine, which infects the system, causing the disease to become constitutional; the microbe itself was mostly confined to the surface, where the action of the virus is widespread and deep."

He further said that, "the most eminent pathologists of the present time do not express any more positive opinions in reference to the action of the specific principle or germ of diphtheria."

Prudden says, "that in the finding of the streptococcus in great quantities in the pseudo-membrane, and the local lesion just beneath, and its absence in any considerable numbers in internal organs, we find ground for the belief that the symptoms of systemic infection are probably, in a large measure due to the absorption of some soluble poison (ptomaine) produced where the streptococci are most actively growing, namely, at the seat of the local lesion, and their most active proliferation."

It is further claimed that the extent of the membranous deposit does not represent the amount of surface from which absorption actually takes place. In other words, we may have an extensive deposit, and a small amount of surface involved, from which the absorption takes place. Other experimenters have shown that the bacteria are sometimes present in the living tissue immediately about the seat of the false membrane, where this is formed, and that they sometimes are, and sometimes are not, found in the internal organs.

Nasseloff asserts, "that the development of organisms is the primary step in the development of diphtheria."

Eberth says that, "diphtheria cannot exist without bacteria." Thus it would seem that the weight of testimony in the light of modern research, goes far in the establishment of the theory that the specific cause of diphtheria is a germ, and that primarily the disease is local.

Brought to this conclusion, the rest is easily told—from the evidence adduced that the germ primarily (as expressed by Prudden) gains a foothold at the seat of the local lesion, inducing its general effect upon the body at large, by the local production of an absorbed ptomaine, and the vulnerability of the germ to certain commonly employed germicidal remedies, marks out the way clearly that we may not err. Prudden found that a two per cent. solution of carbolic acid destroyed the germ in one minute; while a one in a thousand solution of mercuric bichloride killed the germ in one-half a minute.

The great difficulty arises, that the micro-organisms resist the germicidal action of these agencies to a much greater degree, when embedded in the mucous membrane, than when existing in pure cultures; and further the impossibility in small patients to apply or administer the germ destroyer in adequate doses, without danger of producing toxic effect upon the patient.

Of the germicides thus far relied upon in the treatment of diphtheria, carbolic acid locally, and the mercuric salts, both locally and internally, have been relied upon.

In my extremity, whilst treating diphtheria of the most virulent type, during the past winter, being convinced that I could no longer rely upon the "so-called" solvents of the membrane, I used with gratifying results in two cases locally, "Churchhill's Tincture of Iodine," applied with a camel's hair brush, limiting the application as far as possible to the pseudo-membrane, and compelling the patient to keep the mouth open, exhaling with considerable force, until by rapid evaporation, the applications were allowed to dry.

These cases were in the same house, and frequently in the same room (in the capacity of nurses), with a case of virulent diphtheria, and were under constant surveillance, and the first manifestations were recognized, and energetically treated, with the effect, as I firmly believe, of so destroying or sterilizing the bacteria, as to mitigate, if not entirely prevent constitutional infection.

The effect of these applications of iodine, was not to destroy the membrane always on first application, but *two* applications were made daily. Very frequently, the pseudo-membrane was entirely removed by my next visit, and other patches had appeared at different sites, which were doubtless, the result of stray microbes, which had fastened themselves to the mucous membrane, and which had not at last treatment produced the pseudo-membrane.

If I were called to-day to treat a case of diphtheria, it yet being local, I would swab out the throat with a solution of one in one thousand of the mercuric-bichloride, and in a very few minutes, apply "Churchill's Tincture of Iodine." If, however, as is, alas, too often the case when we are called, there should be constitutional infection, as evinced by the rapid pulse, general depression of the vital forces, and swollen cervical glands, I would rely upon those sheet anchors in this disease, mercury and whiskey internally, conjointly with the local treatment.

At a recent meeting of the "King's County Medical Society, Brooklyn," upon the subject of diphtheria, the weight of testimony was largely in favor of whiskey, in doses short of intoxication. When we have a poison to antagonize, it is surprising what amount of alcoholic liquors can be borne.

In the case of my own little boy, last winter, aged seven years, with virulent diphtheria, who had not tasted whiskey since infancy, I gave nearly half an ounce of the best whiskey obtainable, every three hours, for days, without the slightest symptoms of intoxication. In a number of cases, in which I used the stimulant with as great or greater boldness, it was equally well borne.

Mercury I would give for its germicidal effect upon the blood and internal organs, and also for its defibrinating effect upon the blood, since it has been claimed by some writers, that there exists in diphtheria a superfibrination of the blood.

In the use of mercurial preparations, as far as I have seen reported, those published by Dr. John S. Colman, of Augusta, Ga., are, perhaps, the boldest and most satisfactory.

In one case—a child of sixteen months old, he gave with good results, one-eighth grain doses of the bichloride of mercury hourly, until seventy-two doses had been given.

Though having given the *mild* chloride without stint, I have yet to find a case, in which I realized either ptyalism or prostration, as the result of the remedy.

To summarize, I will say: *First*, That in the light of clinical and bacteriological investigations, indications point to a more definite differentiation in membranous diseases of the throat, leading to a better appreciation of their distinctive natures, aided by a clearer nomenclature, in which I bespeak for a place, the word diphtheroid; by which we as physicians, can with greater confidence in ourselves, assure those dependent upon us for medical aid, that *this* is a case of genuine diphtheria, and *that* diphtheroid, a less malignant throat trouble not tending to the same fatality.

Second, That the disease is of bacterial origin and primarily local, at the seat of germ contact.

Third, That in genuine diphtheria there is no reliance whatever to be placed in the "so-called" solvents of the membrane.

Fourth, That we have in carbolic acid Churchill's Tincture of Iodine and the bichloride of mercury locally, and in whiskey or brandy, and the mercuric salts internally, in conjunction with judicious feeding, the only mode of treatment offering any better results than that which has heretofore signalized our failures.

Fifth, That when the public and profession shall be educated to the importance of vigilance and frequent examinations of the throats of the children of the land, and when a deposit is found to exist, to immediately apply those germ destroying remedies, which not only kill the microbes, but also so sterilize the soil outside of the area of the deposit, as to limit its field of destructiveness—"Then, and not till then," can we hope for an improved and successful management of the disease which annually claims so many of the darlings of our land.